

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-3 (Canceled):

Claim 4 (Currently Amended): A semiconductor device, comprising:

a wiring structure comprising

a first wiring layer formed on a surface of a semiconductor region forming an active component or a passive component, and

a second wiring layer formed in an upper layer of the first wiring layer,

a first insulating structure insulating the semiconductor region and the first wiring layer,

a second insulating structure insulating an interlayer formed of the first wiring layer,

a third insulating structure contained in a structure electrically insulating the first wiring layer and the second wiring layer and forming connecting holes electrically connecting the first wiring layer and the second wiring layer, and

a fourth insulating structure insulating an interlayer formed with the second wiring layer, and

comprising in one of the second, third and fourth insulating structures ~~the~~ an insulating material ~~according to claims 1 or 2, said insulating material comprising:~~

a borazine-silicon polymer obtained by hydrosilylation polymerization of

a borazine compound represented by chemical formula 1 possessing an alkyl group for a nitrogen atom and an alkyl group-substituted triple bond-containing organic group for a

boron atom in a borazine ring, in which the boron atom has an acetylene group directly linked thereto or R₂ and an acetylene group jointly linked thereto; and

a silicon compound represented by chemical formula 2 possessing at least two hydrosilyl groups or a cyclic silicon compound represented by chemical formula 3 possessing at least two hydrosilyl groups; in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more),

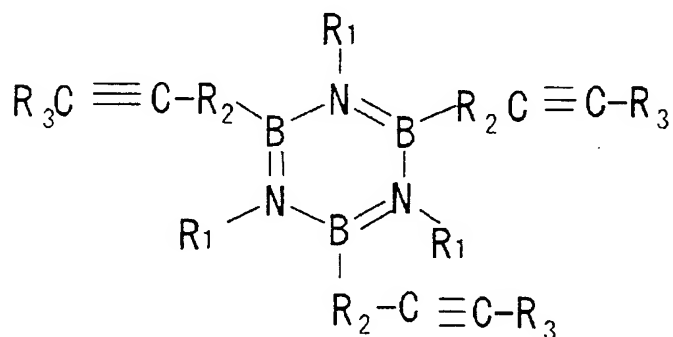
R₃ denotes an alkyl group linked to an acetylene group,

R₄ and R₅ each denote one identical or different monovalent group selected from the group consisting of an alkyl group, an aryl group, an aralkyl group and a hydrogen atom,

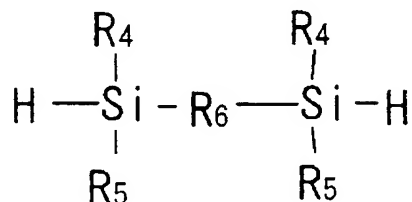
R₆ denotes a divalent aromatic group optionally possessing a substituent group, an oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group, and

R₇ denotes an alkyl group, an aryl group or an aralkyl group;

wherein chemical formula 1 is as follows

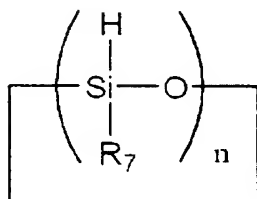


wherein chemical formula 2 is as follows



_____ ; and

wherein chemical formula 3 is as follows



Claim 5 (Currently Amended): An insulating layer, comprising:

the an insulating material of Claim 1;

wherein said insulating layer is between electric wirings; and

wherein said insulating material comprises:

a borazine-silicon polymer obtained by hydrosilylation polymerization of

a borazine compound represented by chemical formula 1 possessing an alkyl group

for a nitrogen atom and an alkyl group-substituted triple bond-containing organic group for a boron atom in a borazine ring, in which the boron atom has an acetylene group directly linked thereto or R₂ and an acetylene group jointly linked thereto; and

a silicon compound represented by chemical formula 2 possessing at least two

hydrosilyl groups or a cyclic silicon compound represented by chemical formula 3 possessing at least two hydrosilyl groups; in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more),

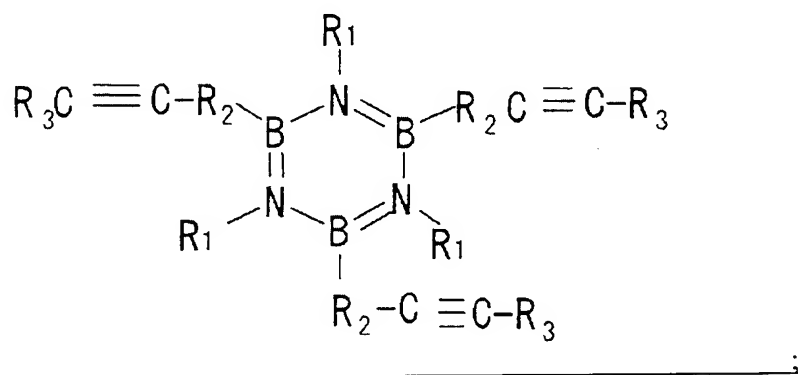
R₃ denotes an alkyl group linked to an acetylene group,

R₄ and R₅ each denote one identical or different monovalent group selected from the group consisting of an alkyl group, an aryl group, an aralkyl group and a hydrogen atom,

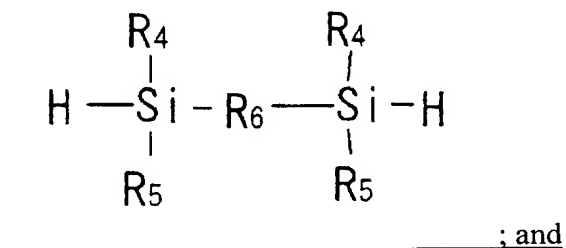
R₆ denotes a divalent aromatic group optionally possessing a substituent group, an oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group, and

R₇ denotes an alkyl group, an aryl group or an aralkyl group;

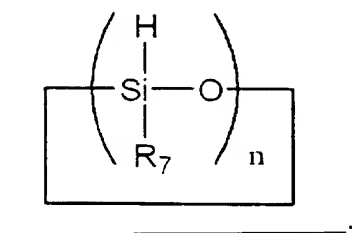
wherein chemical formula 1 is as follows



wherein chemical formula 2 is as follows



wherein chemical formula 3 is as follows



Claim 6 (Currently Amended): An insulating layer, comprising:

the an insulating material of ~~Claim 2~~;

wherein said insulating layer is between electric wirings; and

wherein said insulating material comprises

a borazine-silicon polymer obtained by hydrosilylation polymerization of

a mixture of a first borazine compound represented by chemical formula 4 and a

second borazine compound represented by chemical formula 5, the first borazine compound

possessing an alkyl group for a nitrogen atom and an alkyl group-substituted triple bond-

containing organic group for a boron atom in a borazine ring, in which the boron atom has an

acetylene group directly linked thereto or has linked thereto R2 to which an acetylene group

has been linked, the second borazine compound possessing an alkyl group for a nitrogen

atom and a triple bond-containing organic group not substituted by an alkyl group for a boron

atom in a borazine ring, wherein the boron atom has an acetylene group directly linked

thereto or has linked thereto R9 to which an acetylene group has been linked, the second

borazine compound (formula 5) having a mixing ratio of : 90:10 to 0:100 to the first borazine

compound (formula 4); and

a silicon compound represented by chemical formula 6 possessing at least two

hydrosilyl groups or a cyclic silicon compound represented by chemical formula 7 possessing

at least two hydrosilyl groups, in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more).

R₃ denotes an alkyl group linked to an acetylene group.

R₄ and R₅ each denote one identical or different univalent group selected from the group consisting of an alkyl group, an aryl group, an aralkyl group and a hydrogen atom.

R₆ denotes a divalent aromatic group optionally possessing a substituent group, an oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group.

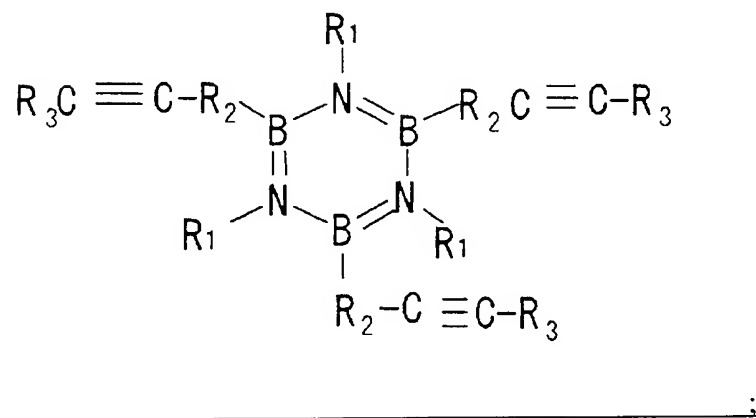
R₇ denotes an alkyl group, an aryl group or an aralkyl group.

R₈ denotes an alkyl group.

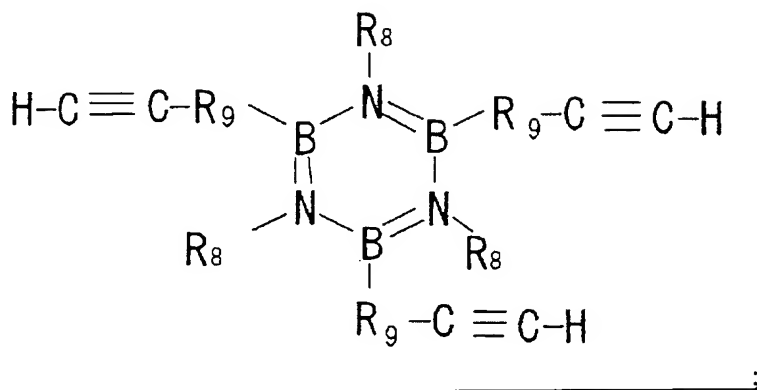
R₉ denotes a methylene group, and

n denotes an integer of 3 or more;

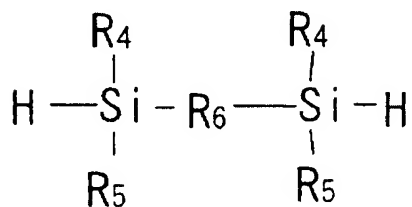
wherein chemical formula 4 is as follows



wherein chemical formula 5 is as follows

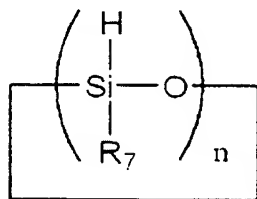


wherein chemical formula 6 is as follows



; and

wherein chemical formula 7 is as follows



Claim 7 (Currently Amended): An ultra large scale integrated circuit (ULSI),
 comprising:

an USLI multilayer interconnection; and

an insulating layer between electric wirings, said insulating layer comprising ~~the~~ an
insulating material ~~of Claim 1~~ which comprises

a borazine-silicon polymer obtained by hydrosilylation polymerization of
a borazine compound represented by chemical formula 1 possessing an alkyl group
for a nitrogen atom and an alkyl group-substituted triple bond-containing organic group for a
boron atom in a borazine ring, in which the boron atom has an acetylene group directly linked
thereto or R₂ and an acetylene group jointly linked thereto; and

a silicon compound represented by chemical formula 2 possessing at least two
hydrosilyl groups or a cyclic silicon compound represented by chemical formula 3 possessing
at least two hydrosilyl groups; in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more),

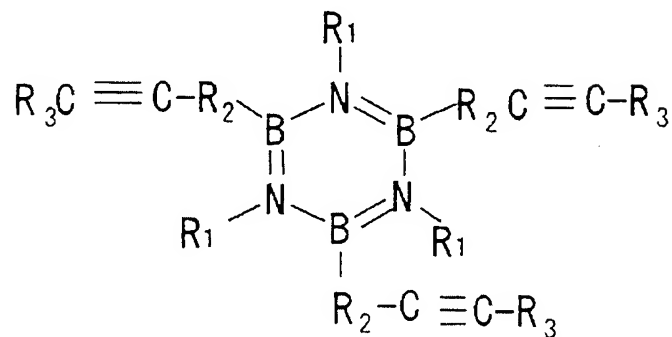
R₃ denotes an alkyl group linked to an acetylene group,

R₄ and R₅ each denote one identical or different monovalent group selected from the
group consisting of an alkyl group, an aryl group, an aralkyl group and a hydrogen atom,

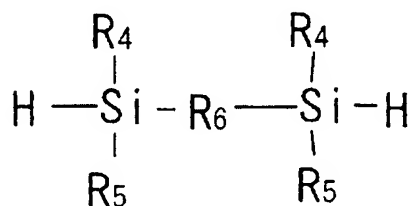
R₆ denotes a divalent aromatic group optionally possessing a substituent group, an
oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group, and

R₇ denotes an alkyl group, an aryl group or an aralkyl group;

wherein chemical formula 1 is as follows

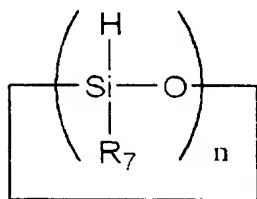


wherein chemical formula 2 is as follows



; and

wherein chemical formula 3 is as follows



Claim 8 (Currently Amended): An ultra large scale integrated circuit (ULSI),
 comprising:
 an USLI multilayer interconnection; and

an insulating layer between electric wirings, said insulating layer comprising the insulating material of Claim 2;

wherein said insulating material comprises
a borazine-silicon polymer obtained by hydrosilylation polymerization of
a mixture of a first borazine compound represented by chemical formula 4 and a
second borazine compound represented by chemical formula 5, the first borazine compound
possessing an alkyl group for a nitrogen atom and an alkyl group-substituted triple bond-
containing organic group for a boron atom in a borazine ring, in which the boron atom has an
acetylene group directly linked thereto or has linked thereto R2 to which an acetylene group
has been linked, the second borazine compound possessing an alkyl group for a nitrogen
atom and a triple bond-containing organic group not substituted by an alkyl group for a boron
atom in a borazine ring, wherein the boron atom has an acetylene group directly linked
thereto or has linked thereto R9 to which an acetylene group has been linked, the second
borazine compound (formula 5) having a mixing ratio of : 90:10 to 0:100 to the first borazine
compound (formula 4); and

a silicon compound represented by chemical formula 6 possessing at least two
hydrosilyl groups or a cyclic silicon compound represented by chemical formula 7 possessing
at least two hydrosilyl groups, in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more),

R₃ denotes an alkyl group linked to an acetylene group,

R₄ and R₅ each denote one identical or different univalent group selected from the
group consisting of an alkyl group, an aryl group, an aralkyl group and a hydrogen atom,

R₆ denotes a divalent aromatic group optionally possessing a substituent group, an
oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group,

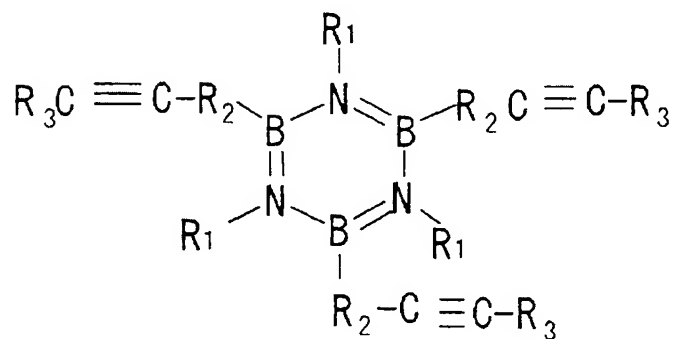
R₇ denotes an alkyl group, an aryl group or an aralkyl group,

R₈ denotes an alkyl group,

R₉ denotes a methylene group, and

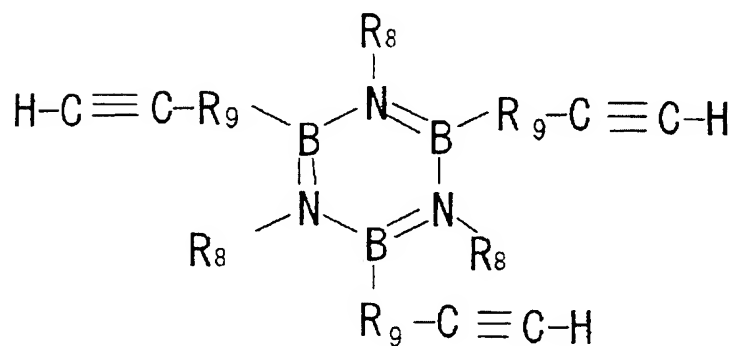
n denotes an integer of 3 or more;

wherein chemical formula 4 is as follows



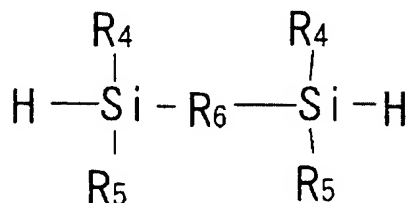
_____;

wherein chemical formula 5 is as follows



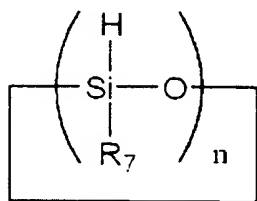
_____;

wherein chemical formula 6 is as follows



_____ ; and

wherein chemical formula 7 is as follows



Claim 9 (New): A semiconductor device, comprising:

a wiring structure comprising

a first wiring layer formed on a surface of a semiconductor region forming an active component or a passive component, and

a second wiring layer formed in an upper layer of the first wiring layer,

a first insulating structure insulating the semiconductor region and the first wiring layer,

a second insulating structure insulating an interlayer formed of the first wiring layer,

a third insulating structure contained in a structure electrically insulating the first wiring layer and the second wiring layer and forming connecting holes electrically connecting the first wiring layer and the second wiring layer, and

a fourth insulating structure insulating an interlayer formed with the second wiring layer, and

comprising in one of the second, third and fourth insulating structures an insulating material, said insulating material comprising:

a borazine-silicon polymer obtained by hydrosilylation polymerization of

a mixture of a first borazine compound represented by chemical formula 4 and a second borazine compound represented by chemical formula 5, the first borazine compound possessing an alkyl group for a nitrogen atom and an alkyl group-substituted triple bond-containing organic group for a boron atom in a borazine ring, in which the boron atom has an acetylene group directly linked thereto or has linked thereto R₂ to which an acetylene group has been linked, the second borazine compound possessing an alkyl group for a nitrogen atom and a triple bond-containing organic group not substituted by an alkyl group for a boron atom in a borazine ring, wherein the boron atom has an acetylene group directly linked thereto or has linked thereto R₉ to which an acetylene group has been linked, the second borazine compound (formula 5) having a mixing ratio of : 90:10 to 0:100 to the first borazine compound (formula 4); and

a silicon compound represented by chemical formula 6 possessing at least two hydrosilyl groups or a cyclic silicon compound represented by chemical formula 7 possessing at least two hydrosilyl groups, in which:

R₁ denotes an alkyl group,

R₂ denotes -(CH₂)-m (m denoting an integer of 0 or more),

R₃ denotes an alkyl group linked to an acetylene group,

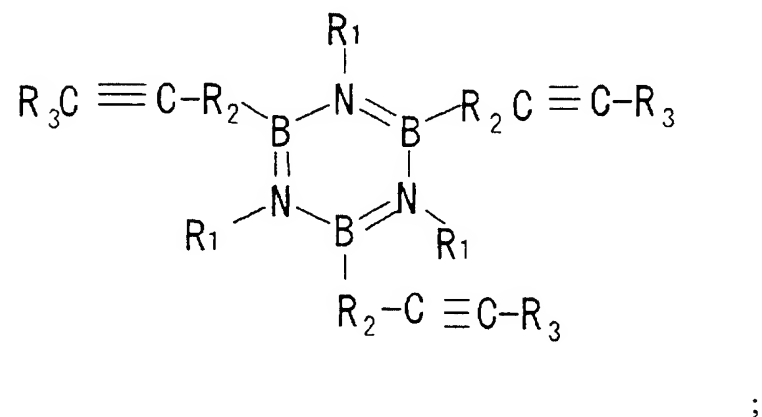
R₆ denotes a divalent aromatic group optionally possessing a substituent group, an oxygen atom, a siloxane or an oxypoly(dimethyl siloxy) group,

R₈ denotes an alkyl group,

R₉ denotes a methylene group, and

n denotes an integer of 3 or more;

wherein chemical formula 4 is as follows



wherein chemical formula 5 is as follows



wherein chemical formula 6 is as follows



wherein chemical formula 7 is as follows

